Sharing of Tools and Information

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FAA Office of the Assistant Administrator for System Safety

2004 Risk Analysis and Safety Performance Measurements Workshop

Office of the Assistant Administrator for System Safety

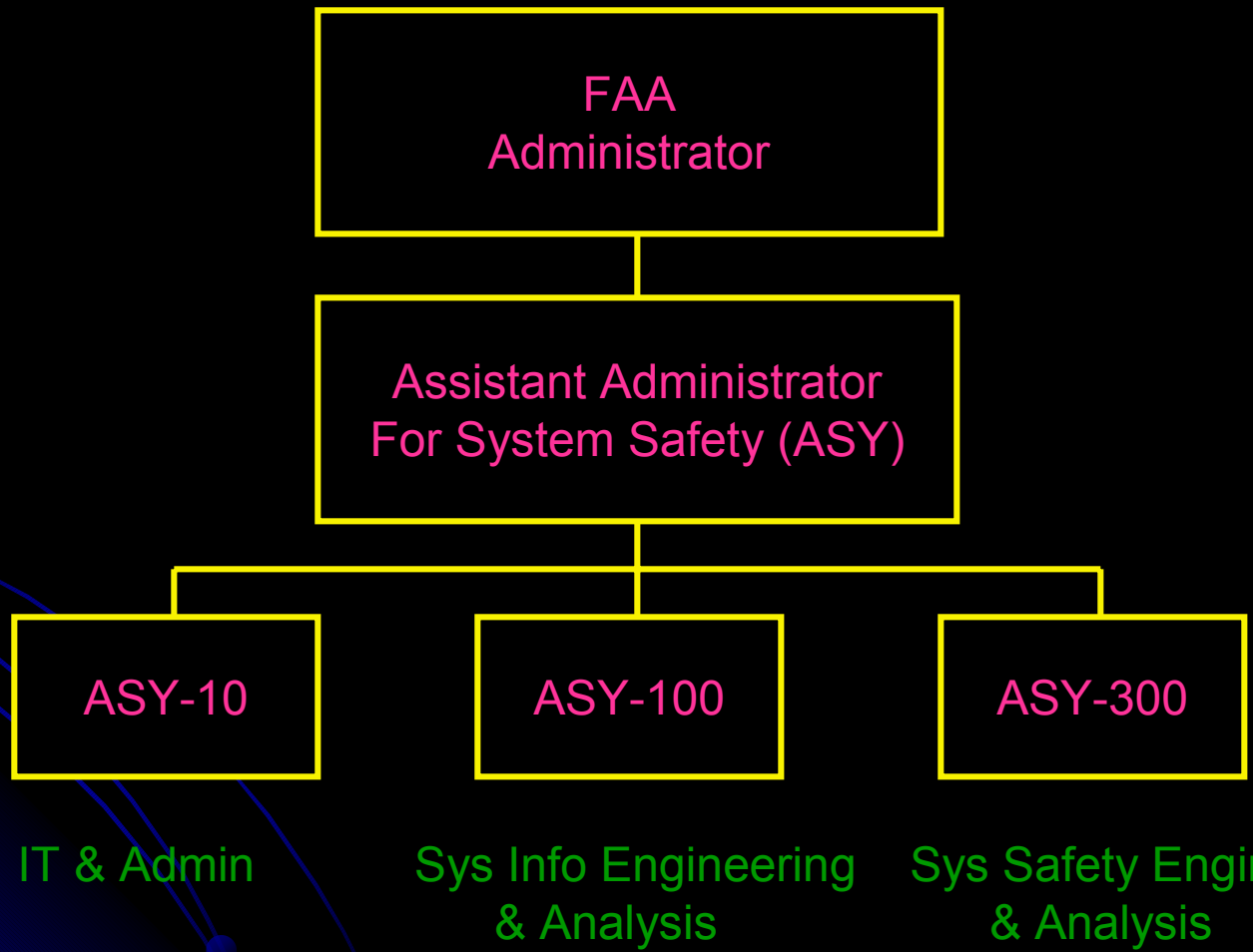
Mission:

Provide leadership in developing, distributing, and applying system safety analytical tools and processes for identifying and resolving safety issues by the international aerospace community

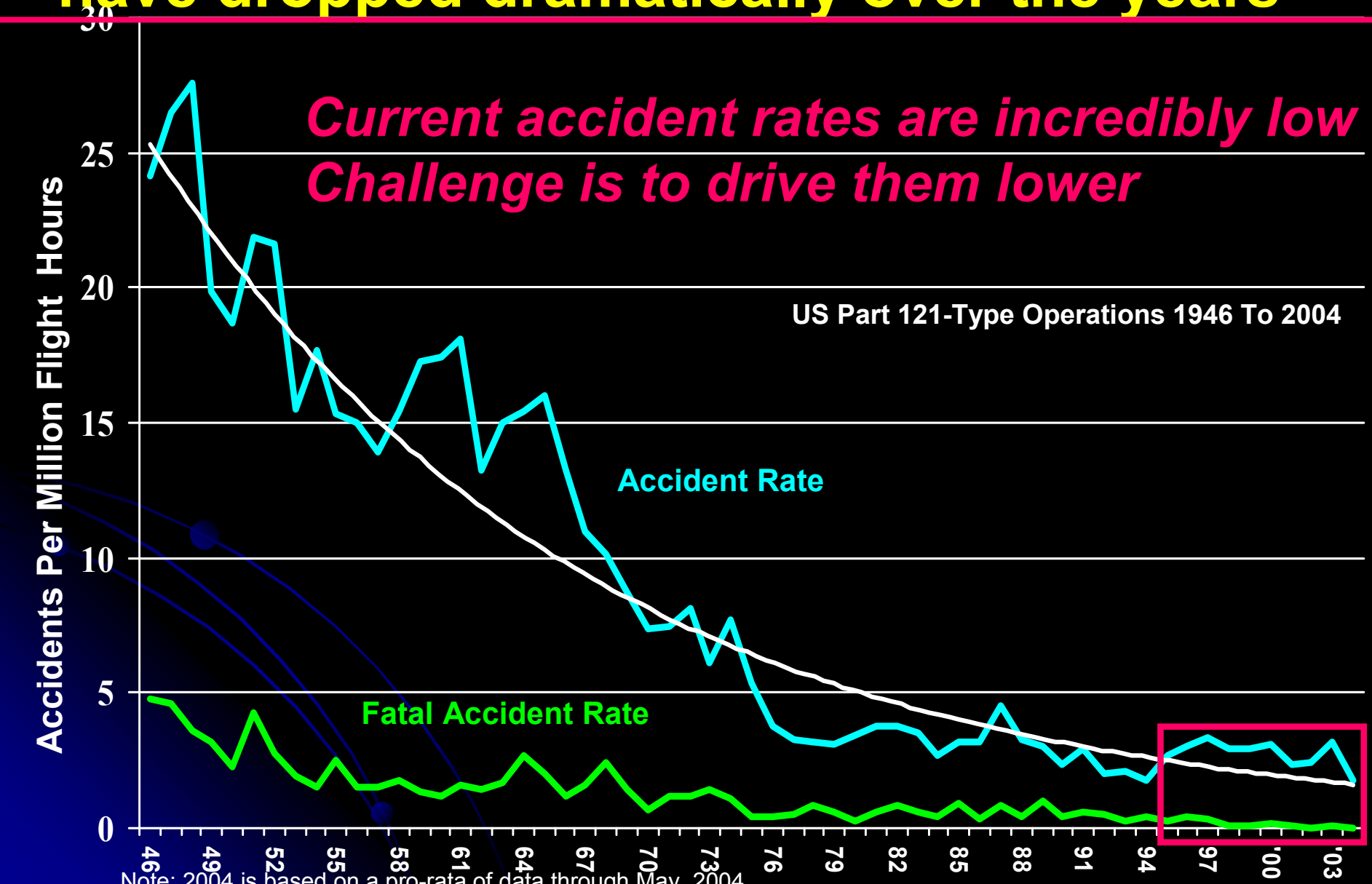
Vision:

Maintain international leadership in developing, disseminating, and applying methods for identifying and resolving aerospace system safety issues.

Office of the Assistant Administrator for System Safety



Accident rates in US and Western Europe have dropped dramatically over the years

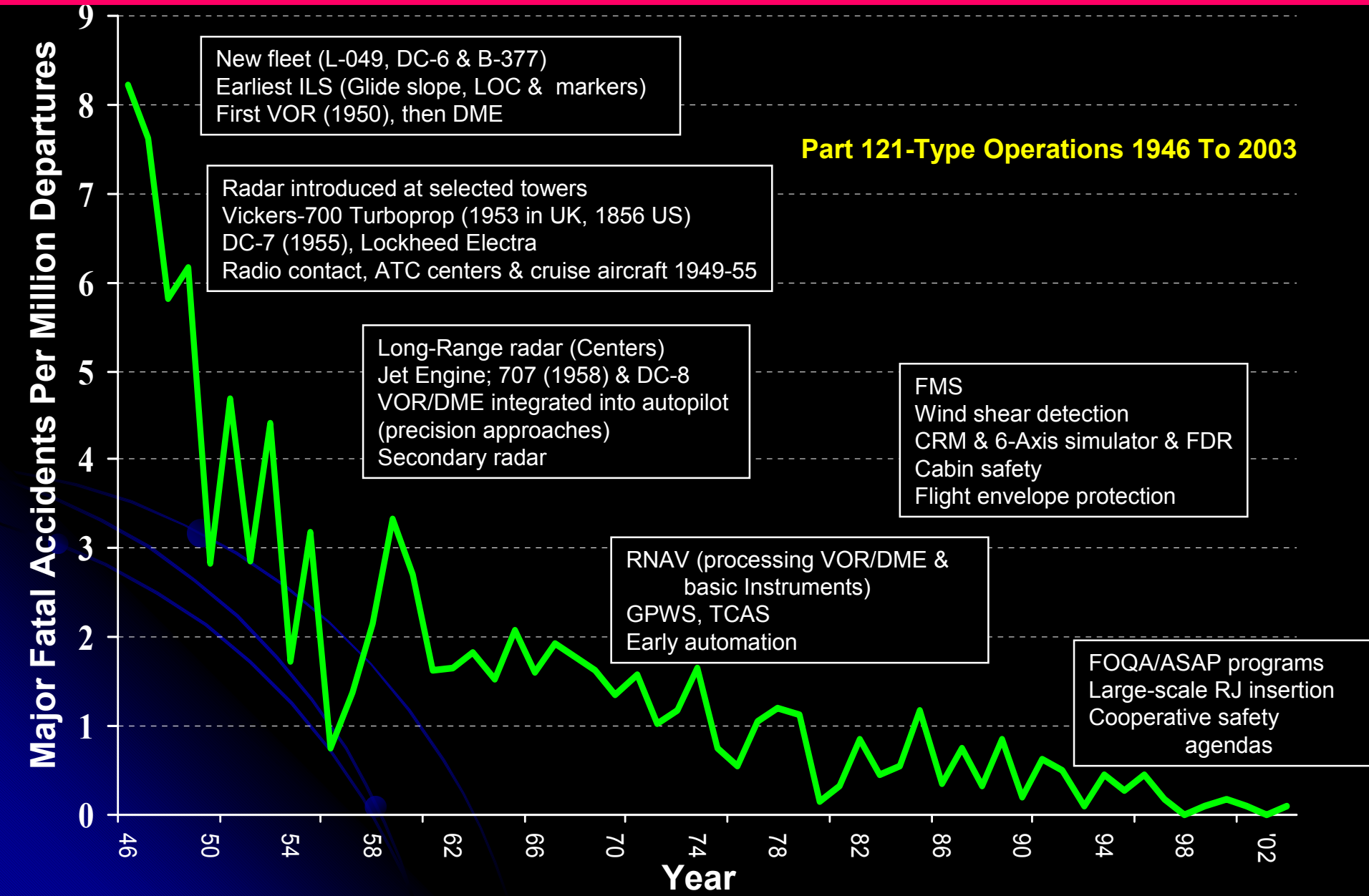


Note: 2004 is based on a pro-rata of data through May, 2004.

Achieving Accident Reductions

- Technology
- Procedures
- Analysis
  - New Data Sources
  - New ways of analyzing old data

New capabilities & Focused Actions



Technology

- Automatic Ground Collision Avoidance System (AGCAS)
  - DOD Aviation Safety Improvement Task Force Number 2 priority behind MFOQA
  - FY93-04 $3.5B in CFIT loss
  - Believe 90% could have been avoided
- Automatic Airborne Collision Avoidance System (AACAS)
  - Other than for fighters, TCAS is adequate

Controlled Flight into Things

or a Land and Hold Short Operation

Technology

- Ground Proximity Warning System (GPWS)
- Enhanced GPWS (EGPWS)
- Terrain Awareness Warning System (TAWS)
- Weather In-the-Cockpit

Procedures

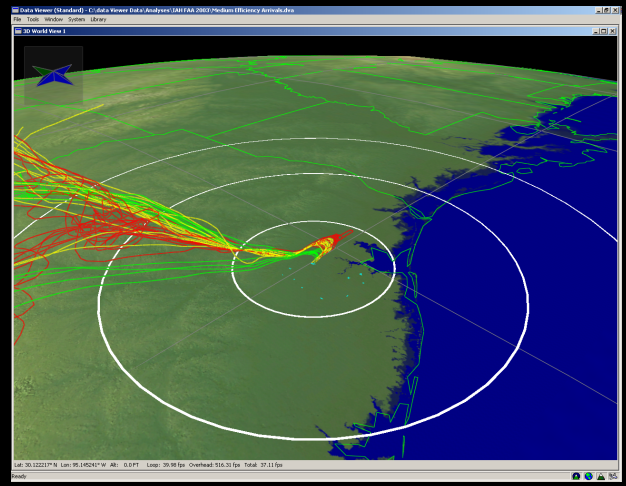
- Safety Culture
- Safety Risk Management
  - Air carriers
  - General aviation
  - Regulators
- Safety Management Systems

Analysis

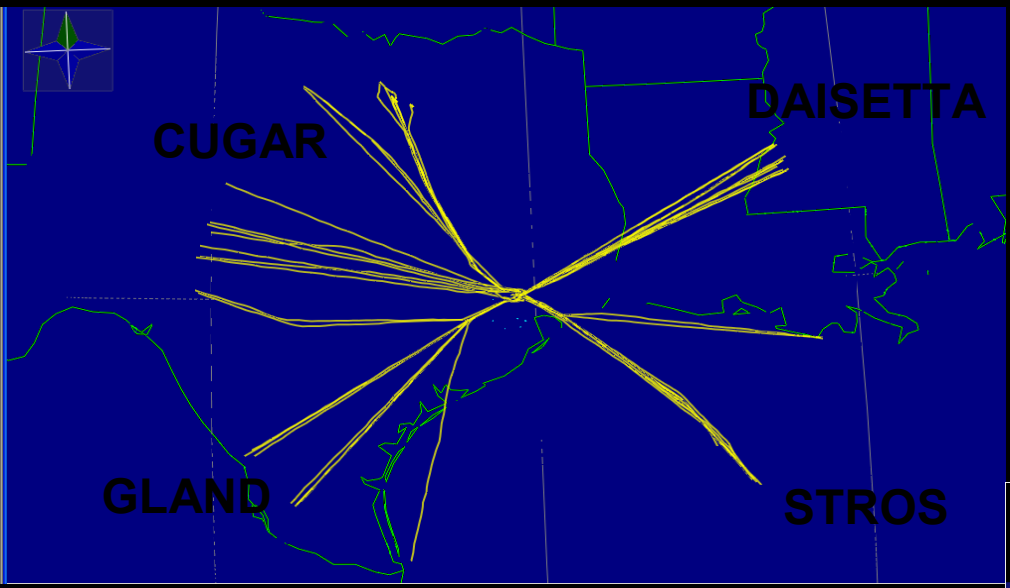
- New Sources of Data
  - Aviation Safety Action Programs (ASAP)
  - Flight Operations Quality Assurance (FOQA)
- New Look at Old Data
  - Applying tools from other areas to aviation data
    - Intelligence community text and data mining applied to textual aviation data
    - FOQA visualization and analysis tool applied to digital aviation data

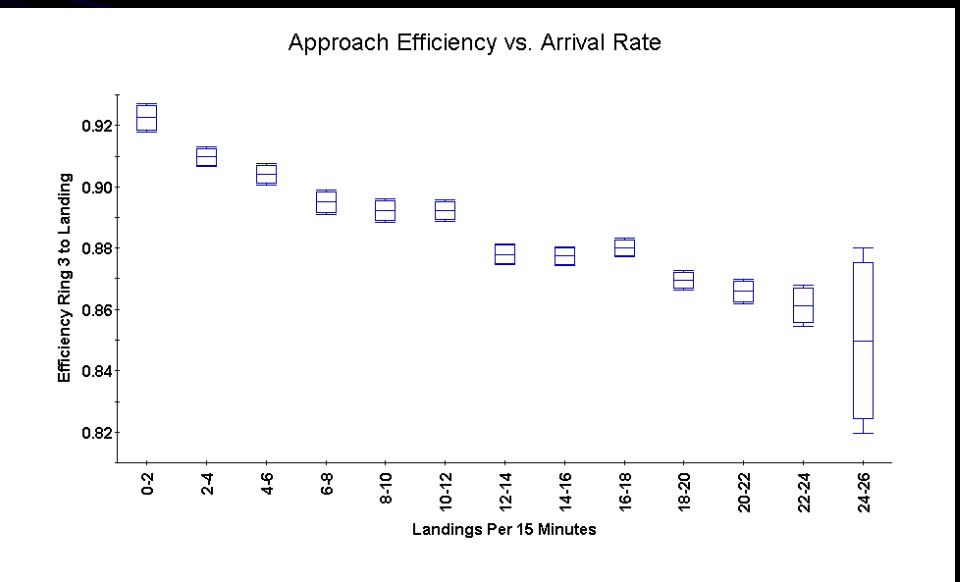
Capabilities of Visualization and Analysis Tool

- Provides the ability to merge, integrate, and utilize various data types and then identify events of interest
- Allows for user-configurable measurements, trending, correlations, drill-down, and visualizations
- User-configurable framework enables rapid and flexible processing of diverse aviation analysis requirements
- Tool enables experts to rapidly explore & develop measures important to safety & operations

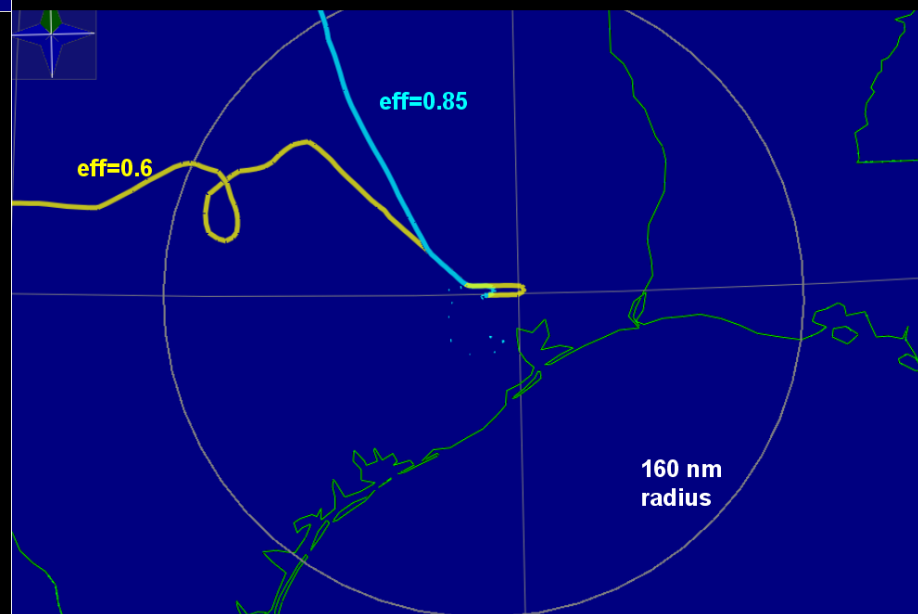


IAH Visualization & Analysis





Distance-Based Arrival Efficiency Measure Agrees with Intuition



Current Focus of Work

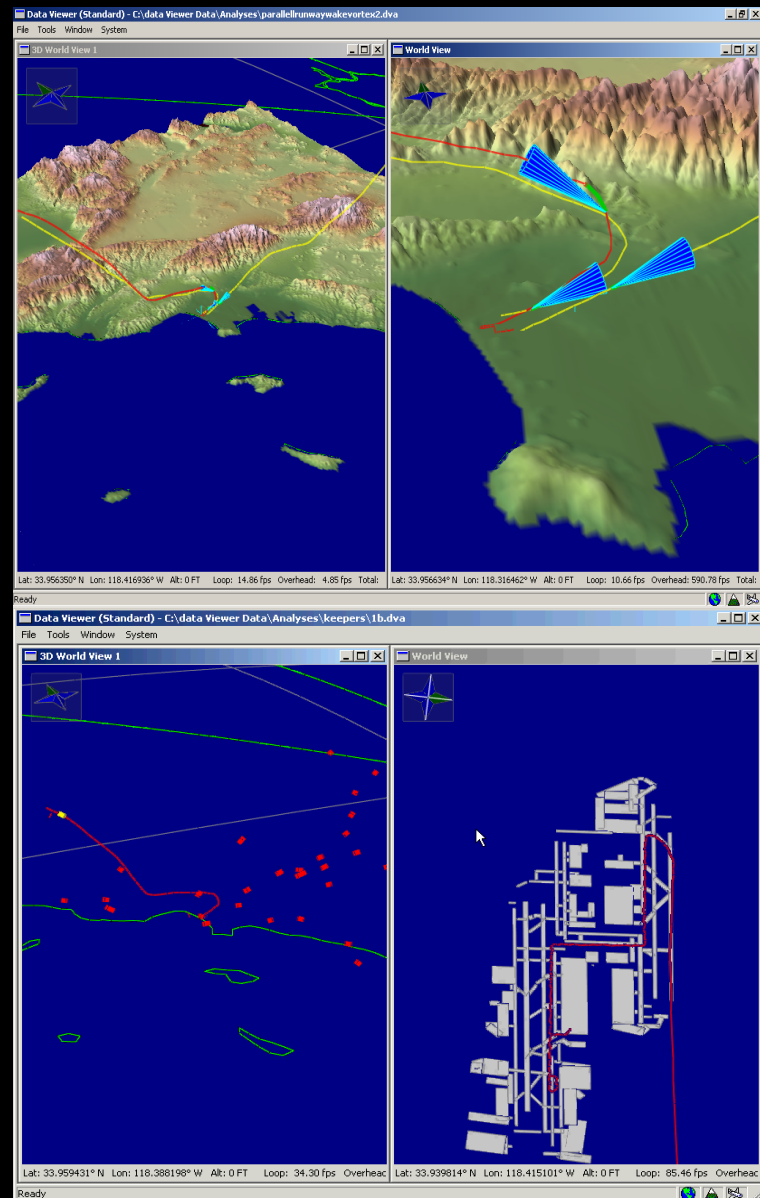
- Application to real-world problems:
  - Aircraft separation and closure rate metrics
  - TCAS RAs issues identified by airlines
  - Improve and validate traffic complexity metrics
  - Provide analysis and data for stochastic modeling of human factors for runway safety

Support Runway Safety Office Stochastic Modeling Human Factors

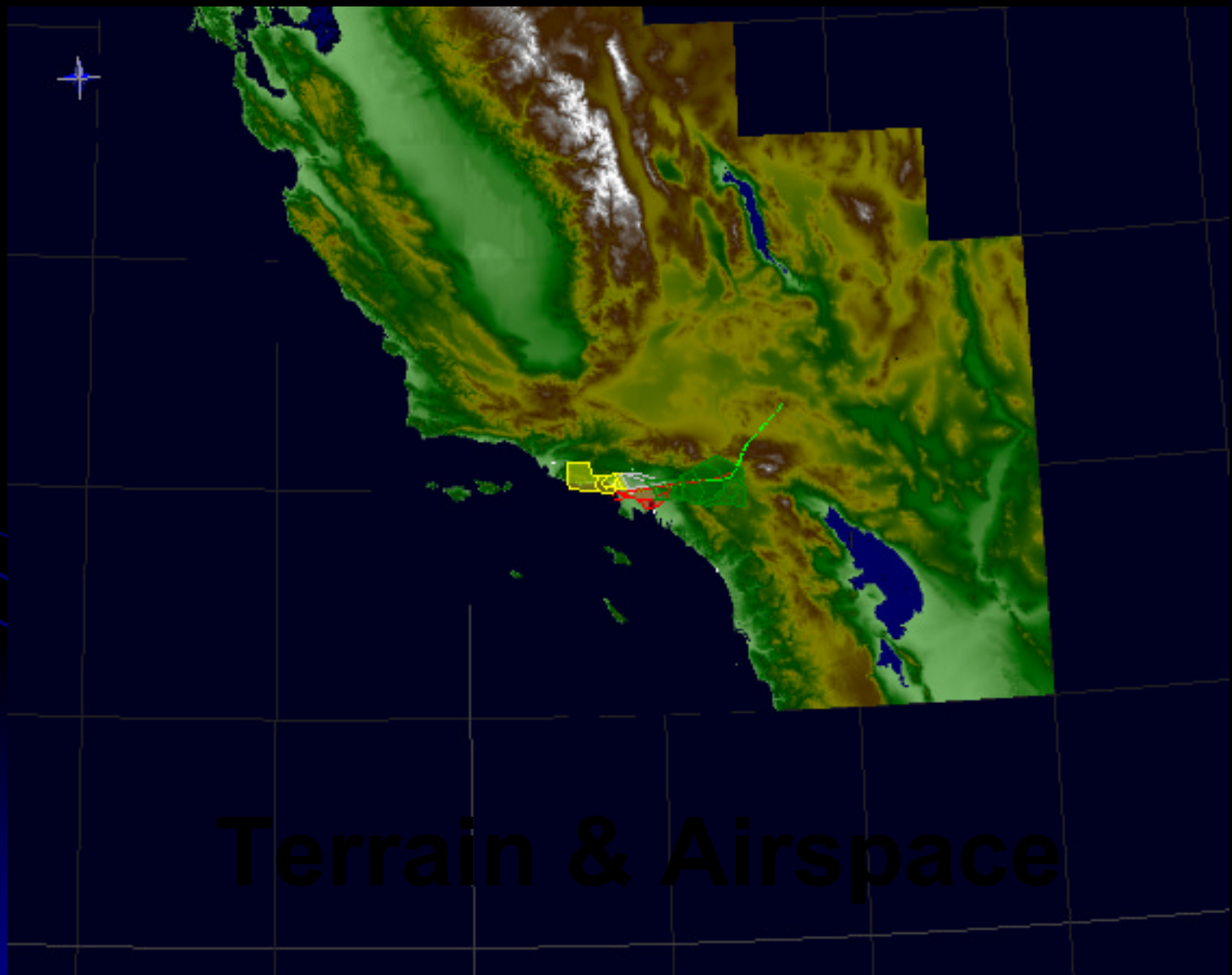
- Support Runway Safety Office with data from actual operations for purpose of modeling and prediction.

- Provide measurements of runway occupancy time, closest proximity of aircraft & other physical measures derived from aircraft temporal positions at airport.

- Provide measurements related to probability of encountering wake vortex event

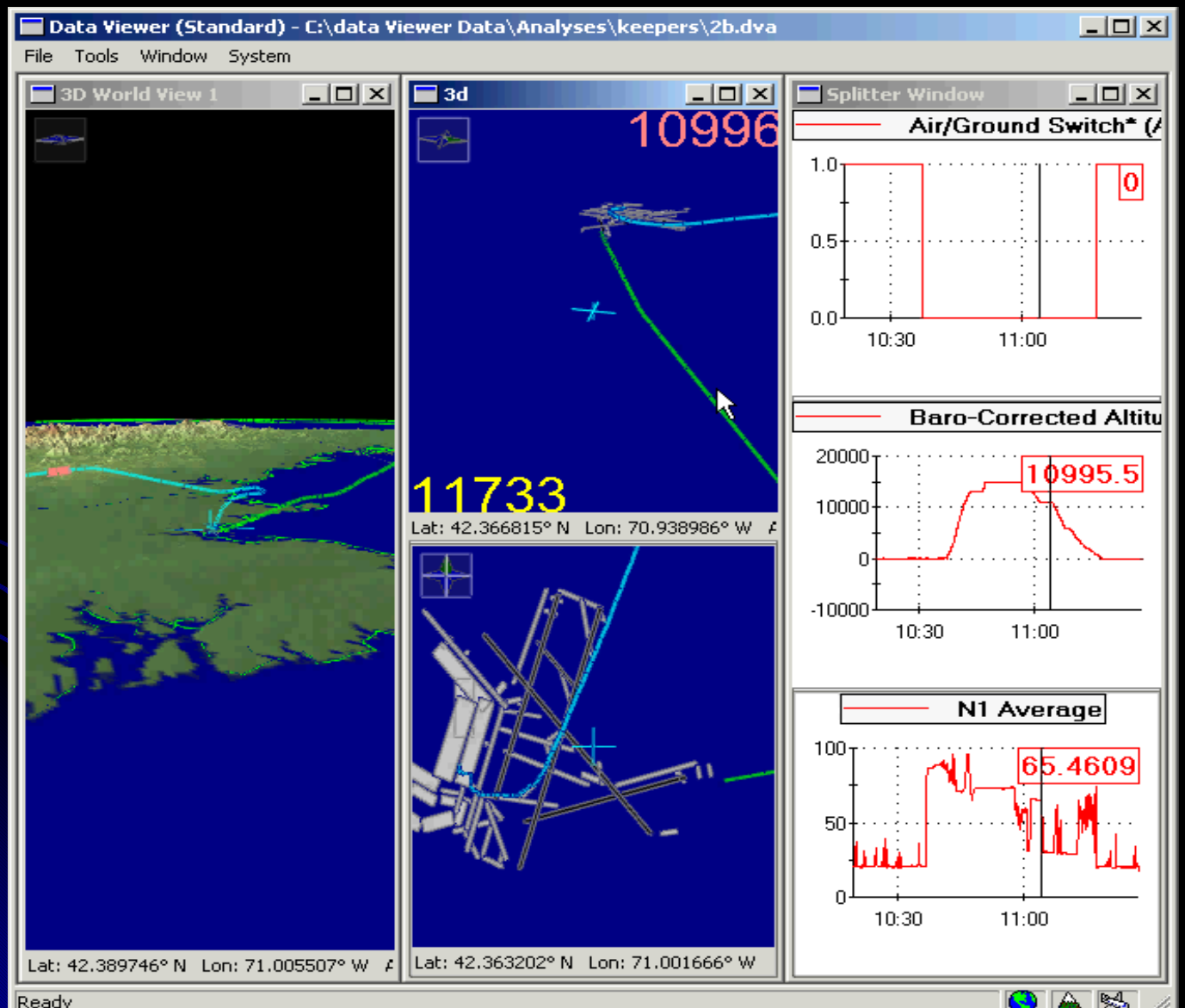


Airspace Visualization



Runway Change Visualization

BOS Multi Data Visualizations



The Future ??

Sharing of Tools & Information

Analysis and Data Integration

- Weather
- Terrain
- FOQA
- Radar
- Airports-
- Routes
- Approaches
- Voice
- Video